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BIRTH EVENTS, APPENDICITIS, AND APPENDECTOMY

by


YIZHAR EYLON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Birth Events, Appendicitis, and Appendectomy", submitted by Yizhar Eylon in partial fulfillment of the requirements for the degree of Master of Arts.





## ABSTRACT

Two groups of surgery patients were interviewed in hospital a few days after operation, in order to find out whether there was a birth event (BE) preceding their admission to the hospital. One group consisted of 35 patients undergoing appendectomy, following a primary diagnosis of appendicitis; the second group was composed of 35 patients matched according to age and sex to the appendectomy patients and undergoing a variety of other operations in the same hospital and at the same time. A significant association between BE and appendectomy was found; the association between BE and other operations did not exist. Certain psychosocial variables were found to affect the strength of association between BE and appendectomy. The results were discussed with reference to the Papez-MacLean theory of psychosomatic disease and findings presented in sociological literature.



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## TABLE OF CONTENTS

	PAGE
Abstract .. .. .	iii
Acknowledgments .. .. .	iv
List of Tables .. .. .	vi
Introduction .. .. .	1
Method .. .. .	11
Subjects .. .. .	11
Appendectomy group .. .. .	11
Matched cases group .. .. .	12
Selection of the subjects .. .. .	12
Procedure .. .. .	13
Definition of birth event .. .. .	14
Assignment to experimental groups . .. .	14
Results .. .. .	16
Preliminary considerations .. .. .	16
Test of the hypotheses .. .. .	17
Additional findings .. .. .	21
Discussion .. .. .	27
The main hypothesis .. .. .	28
The remaining hypotheses .. .. .	33
Additional findings .. .. .	35
Suggestions for further research .. .. .	37
References .. .. .	39
Appendices .. .. .	42
A. The method of construction of SES indices	42
B. The questionnaire used for interviewing the AI group .. .. .	44
C. The questionnaire used for interviewing the MC group .. .. .	57



## LIST OF TABLES

TABLE		PAGE
1	Summary of group names by abbreviation, description, and source. .. .. .	15
2	Distribution of males and females in the AI and ANI groups. .. .. .	16
3	Distribution of appendectomies and other operations in the BE and NBE groups (the groups defined according to the original specifications). .. .. .	17
4	Distribution of appendectomies and other operations in the BE and NBE groups. ..	19
5	Distribution of pathological and normal appendices in the BE and NBE group. ..	19
6	Distribution of appendectomies and other operations in the BE and NBE groups among young females and in the rest of the sample. .. .. .	20
7	Distribution of appendectomies and other operations in the BE and NBE groups among females with upper SES and in the rest of the sample. .. .. .	20
8	Distribution of appendectomies and other operations in the BE and NBE groups among males and females. .. .. .	21
9	Distribution of appendectomies and other operations in the BE and NBE groups among younger and older subjects. .. .. .	22
10	Distribution of appendectomies and other operations in the BE and NBE groups among subjects born in Canada and subjects born abroad. .. .. .	23
11	Distribution of appendectomies and other operations in the BE and NBE groups among subjects with low SES and upper SES. ..	24
12	Distribution of appendectomies and other operations in the BE and NBE groups among married and unmarried subjects. .. ..	25
13	Distribution of appendectomies and other operations in the BE and NBE groups among parents and non-parents. .. .. .	26
A-1	Assignment of points for education, income and occupation. .. .. .	42





## INTRODUCTION

Freud (1905), in describing the case of Dora, was probably the first to relate appendicitis to birth fantasies. When 17 years old, this patient suffered a sudden attack of appendicitis. A year later, in the autumn of 1900, Dora was under analysis with Freud. It was discovered then that the earlier illness occurred nine months after an episode in which she received improper proposals from a married man. She had been caring for this man's children (by his real wife) and had secret hopes that he would marry her. Freud concluded that "Her supposed attack of appendicitis had thus enabled the patient...to realize a fantasy of childbirth" (p.103).

Almost two decades later, Stoddart (1922) reported the case of a male patient undergoing psychotherapy who one day told his analyst that he had swallowed a grape pip and was afraid it might give him appendicitis. Analysis of this fear revealed that the patient's concept of the appendix was "...that of a tube leading into a hollow cavity..." (p.45). Appendicitis was considered a distension of this cavity, which might be caused by the swallowed grape pip. Stoddart points out that a grape seed could "germinate into life". Seed is a symbolic equivalent to semen. The distension of the cavity would therefore be akin to a pregnancy.

Groddeck (1923) interpreted an attack of appendi-



cititis in a male as a wish to be a woman in order to be able, ultimately, to bear a child. According to him, this wish is demonstrated through many somatic symptoms and appendicitis is only one of the several possibilities (pp. 15-19).

These ideas were not pursued further. Indeed, psychosomatic medicine has not devoted much attention to the problem of appendicitis. The books of such authorities in psychosomatic medicine as Alexander (1950), Alexander and French (1948), Grinker and Robbins (1953), the Liefs (1963), and Wittkower and Cleghorn (1954) do not contain any references to appendicitis.<sup>1</sup> On the other hand, in her compendium of psychosomatic literature, Dunbar (1954) reviews a few papers dealing with psychological factors in appendicitis. While it is pointed out that psychogenic factors are of importance in this illness, they are not defined and no reference is made to birth. Furthermore, the main subject of discussion is pseudoappendicitis. Continuing this focus, Dunbar (1955) describes the case of an analyst whose patient underwent an appendectomy. Shortly afterwards, following some emotional upsets, the analyst himself was stricken with severe abdominal pains which were exactly like those experienced during an attack of appendicitis. He was reluctant to submit to an operation and "began to think of what might have caused his pains". Upon his discovery of various possible gains from illness at that particular time,

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1. In these books "appendicitis" is not even mentioned in the index of subjects.





the abdominal pains subsided. Subsequent medical examination confirmed "that there was nothing wrong with his appendix" (pp. 49-50).

In like vein Weiss and English (1957) deal briefly with the case of a patient who, beginning with appendectomy, had a series of abdominal operations in quick succession. The patient was diagnosed as suffering from "chronic appendicitis".<sup>2</sup>

It can be seen, then, that psychosomatic medicine has rarely dealt with appendicitis and whenever it has done so, the main concern has been with what might be called "functional appendicitis", that is, with those patients whose appendices, upon removal, are found to be normal in subsequent laboratory examination. This problem has aroused considerable interest among physicians in general.

There seem to be two reasons for this interest. Firstly, every physician encounters many cases of appendicitis in his practice. It is "at one and the same time one of the best recognized clinical entities and one of the most difficult diagnostic problems that confront the physician" (Robbins, 1962, p. 701). Therefore, the medical profession wanted to know how often the preoperative diagnosis of "appendicitis" is wrong and why. Secondly, some attention has been attracted by the problem of which categ-

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2 In this context it is of interest to present the opinions of prominent pathologists: Robbins (1962) writes that "True chronic inflammation of the appendix is rare" and unequivocal differential diagnosis uncertain (p. 702); moreover, Boyd (1961) states that "...it is doubtful if there is such an entity as chronic appendicitis..." (p. 761).



ories of patients are most prone to have a normal appendix removed.

With some reference to the first matter, Barnes, Behringer, Wheelock, and Wilkins (1962) studied 4500 records of acute appendicitis patients that were admitted to an American hospital during the years 1937-1959. In 15.2% of these the preoperative diagnosis of acute appendicitis was not confirmed postoperatively; 2.4% were given a preoperative diagnosis other than acute appendicitis, but were diagnosed postoperatively as acute appendicitis.

Hobson and Rosenman (1964) reviewed the charts of all patients in an American hospital who had preoperative diagnosis of acute appendicitis during the period 1957-1962. Out of 801 patients, 172 (21%) had normal appendices, of these 172, 86 (50%) had no anatomic abnormalities to explain their symptoms.

Weinstein (1965) found that in an American community hospital, during a period of two and a half years, 316 patients were given a diagnosis of acute appendicitis and operated on; in 77 (27%) the diagnosis was not confirmed by pathological examination. Among the 77 patients with normal appendices, 34 (44%) were found to have no abdominal abnormality.

In reference to which categories of patients are most prone to have normal appendix removed, Lee (1961) studied a large sample of patients in the British National Health Service hospitals during the years 1956-57. All





cases considered had "appendicitis" as their principal diagnosis when they left the hospital. Lee found that for males the highest frequency of appendicitis occurs at age 12, for females at age 17. The other finding was that the ratio of female to male cases of appendicitis at age 15-24 varied between 1.6-1.8 (years 1955-1957). In the period 1931-35 it was 1.8, i.e., no change in the ratio over the years. The histological data were not available, but Lee feels that in young females some "appendicitis" cases are not due to inflammation of the appendix.

Harding (1962) examined 1300 appendices removed surgically over a period of seven years beginning in 1955. He found that in the sample as a whole there were 39.6% normal appendices, but the percentage of normal appendices varied between different age-sex groups. The highest percentage was found among females 11-20 years old-- 62.0%; among the males in the same age group the percentage was only 24.6%. The author advances two hypotheses as explanation for so many diagnostic errors in young females: (a) the symptoms are derived from the ovary and, (b) psychological reasons.

Thompson (1962) commented on Harding's young females diagnosed as acute appendicitis: "It is interesting to note that many of these cases are cured by a removal of a normal organ...". As an explanation he added, "...with these patients there is often a big appendix complex in the family". Some weeks later, however, Moir (1962) point-



ed out that the removal of a normal appendix cures nothing, because the pain recurs.

More recent studies (Ingram, Evans, & Oppenheim, 1965; Meyer, Unger, & Slaughter, 1964) attempted to find a relationship between "normal appendectomies" and psychosocial factors operating in such patients.

The Ingram research studied 118 female patients (age 15-35) whose final diagnosis on admission was "appendicitis" or "pain in the right iliac fossa--cause unknown". The figure represents all the female patients with the above diagnoses admitted to one surgical unit in a British hospital during a period of four years. Ninety-one patients were actually operated on, 56 of these were found to have normal appendices. The social history of each patient was obtained by a social worker in one interview and the Cornell Medical Index was administered to all the patients. A follow-up interview was carried out 1-3 years after the initial investigation. Some could not be met again personally and the information was obtained by letter from the patient herself or from other sources. The result of the operation was defined as "satisfactory" if the patient was cured of her abdominal pain and had no new complaints. It was deemed unsatisfactory if there were recurrence of the abdominal pain and/or additional complaints of psychosomatic symptoms.

The investigators found that in the group operated on, women who had normal appendices removed had significant-





ly more emotional problems than women with diseased appendices. Results of the follow-up in which 112 of the 118 patients were traced, showed: (a) satisfactory outcomes were much more likely after the removal of a diseased appendix; (b) there was an association between emotional problems and an unsatisfactory outcome at time of follow-up. The authors, explaining these data, conjecture that when the appendix is normal the origin of the pain may be the right colon.<sup>3</sup>

Meyer and his colleagues (1964) included in their initial sample 533 patients in an American hospital operated upon for the primary diagnosis of appendicitis during the years 1949-1951. According to the pathologists' diagnosis 144 were excluded from the sample since it was doubtful whether the appendix was the cause of symptoms. This left a sample of 389 patients in whom, according to the pathologists' diagnosis: (a) the appendix was surely the cause of symptoms, or (b) surely was not the cause of symptoms.<sup>4</sup> The hospital records of all these patients were reviewed.

There were 173 female patients in the sample. The type of hospital service was selected as an index of

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3 If this is a valid explanation, then it is understandable why the removal of a normal appendix rarely cures abdominal pain.

4 The cases in category (b) were then diagnostic errors and probably the majority suffered from other illness that caused the symptoms of appendicitis (e.g., ovarian cyst, mesenteric adenitis, etc.).





economic class: ward service was construed as an indicator of lower economic class, semi-private and private service as an indicator of higher economic class. Of these females 103 were in the age range 10-29 years: 46 of them were located for a health interview conducted by a psychiatric social worker 9-12 years after the appendectomy, information on 19 additional females was obtained by questionnaire, leaving 38 on whom information could not be obtained.

The researchers found that the female patients between the ages of 10 and 29 had a higher proportion of normal appendices removed than the male patients of the same age. In other age groups a significant difference between the sexes was not present. It was also found that the young female patient who had a normal appendix removed had more illness in the ten years following appendectomy than one who had a pathological appendix removed. Finally, among all the females (173 patients) there was a significantly larger proportion of normal appendices removed from patients in the higher economic class as compared with the patients from the lower economic class.

In the last decade only one author has pointed out that there exists a possibility of a relationship between birth fantasies and appendicitis. Inman (1958, 1962) cited a few cases of appendicitis in which the illness could be related to birth fantasies. In the majority of cases there existed a temporal proximity between the appendicitis and a birth of a baby or a wedding in the psychological



vicinity of the afflicted person. Following Inman's thinking it is reasonable to assume that there is some event in real life that gives rise to birth fantasies, which initiate acute pain in the right iliac fossa, leading to the diagnosis of acute appendicitis and appendectomy. The most plausible events related to birth fantasies would be, in all likelihood, childbirth, forthcoming childbirth, or wedding among people who are psychologically close to the patient. The following hypothetical chain becomes obvious: a birth event (childbirth, forthcoming childbirth, or wedding); birth fantasies; pain in the right iliac fossa; diagnosis of acute appendicitis; appendectomy.

Inman's suppositions were based on perceptive observations, distributed over a period of time. Owing to the circumstances within which his thinking emerged a pathologist's findings could not be included in his work and the number of cases described is limited. Nonetheless, worthwhile testable hypotheses may be derived from his ideas.

The present study will test the following hypotheses:

(1) The proportion of appendectomies among surgery patients who have a birth event in their personal history (BE group) will be significantly higher than the proportion of appendectomies among surgery patients who do not have a birth event in their personal history (NBE group).

(2) The proportion of normal appendices will be higher in appendectomies following birth events than in appendectomies





not following birth events.

(3) In the group of young females the proportion of appendectomies in the BE group will be higher than in any other group of surgery patients formed on the basis of sex and age.

(4) In the group of females with high socioeconomic status (high SES) the proportion of appendectomies in the BE group will be higher than in any other group of surgery patients formed on the basis of sex and SES.



## METHOD

Subjects. The sample used in this study was composed of 70 patients who underwent an operation at the Royal Alexandra Hospital in Edmonton between October 1, 1965 and January 6, 1966. There were two groups: appendectomy and matched cases.

Appendectomy group. In order to minimize the influence of the diagnostic error of the operating surgeon, it was decided to include in the appendectomy group only those patients whose preoperative and postoperative diagnoses were both appendicitis.

All patients meeting this requirement, 15 years of age or older, and who underwent an appendectomy in the hospital between October 1, 1965 and December 23, 1965 were potential subjects. There were 49 such patients in the hospital. However, only 35 have been included in the study and interviewed (AI group). Fourteen patients were not interviewed (ANI group), although they were potential subjects. The reasons for not interviewing them were: five patients were discharged from the hospital earlier than expected, for five patients the attending physician's permission to interview his patient could not be secured, one patient was a deaf-mute, one patient did not speak English, for one patient an answer from the attending physician was not obtained before the patient's discharge from the hospital, and one patient refused to be





interviewed. There were 21 males and 14 females in the AI group. The ANI group was composed of six males and eight females.

Matched cases group. This group (MC) was selected from among all the patients who underwent an operation other than appendectomy in the hospital during the same period of time as the AI group. However, the following categories of patients were a priori excluded from this group: patients undergoing surgery following accident or fracture (because these injuries are often externally imposed), tonsillectomy patients (because usually they leave the hospital before they can speak freely), and children below 15 years (because there were no children in the AI group). Matched cases, paired according to sex and age to cases in the AI group, were selected from the remaining pool of the surgery patients. There were 21 males and 14 females in the MC group.

Selection of the subjects. Between October 1, 1965 and December 23, 1965 the records of the Operating Room of the hospital were checked daily. Whenever a case that could be included in the AI group was found, the records for that day were scrutinized for a matched case to be included in the MC group. The cases were matched to AI patients according to sex and age. Any patient of the same sex, up to two years younger or older than the AI case to be matched, was considered. If more than one potential matched case was found on a particular day, the selection was determined by tossing a die. If potential matched cases could not be found on the



same day, the records were searched during the following days, until at least one potential matched case was found. Whenever the selected matched case was not available for interviewing, another patient was selected in one of two ways: (1) from among the potential matched cases operated on the same day but rejected following the tossing of the die; (2) if cases were not available from the same day, the Operating Room records were searched during the following days, until at least one matched case was found. For this reason the intake of MC patients continued until January 6, 1966.

After the selection of a potential subject, the head nurse on his ward was asked to request permission of the attending physician to interview the patient. Following the physician's approval the patient was asked to participate in the study and if he agreed, he was interviewed. If a potential AI subject could not be interviewed, his matched case was not included in the study.

Procedure. The subjects were interviewed in the hospital a few days after the operation, but not earlier than on the second post-operative day. The interview was conducted in a room in which only the subject and the interviewer were present. After the ward nurse had introduced the interviewer to the patient and left the room, the reasons for the visit were briefly explained and the enquiry commenced forthwith. The interview was structured, based on an open-ended questionnaire. The same basic question-





naire was used for all the subjects included in the sample (see Appendices B and C). At the end of the study the reports of the pathologist were checked for each interviewed subject in the AI group to find out whether the removed appendix was pathological or normal.

Definition of birth event. In terms of time this concept was defined as within one month before or after the operation. By persons involved, it included parents of the subject, spouse, siblings, children, aunts, uncles, first cousins, and the five psychologically closest people not already listed. The five psychologically closest people were determined on the basis of sociometric choices given by the subject during the interview. The birth event was denoted as an actual birth of a baby, a pregnancy, and a wedding at which the subject was present.

Assignment to experimental groups. The study group (BE) was composed of all those subjects whose interview data revealed a birth event as defined above, in their background. The control group (NBE) was composed of all those subjects whose interview data did not reveal a birth event. As can be seen from the diagram (Table 1) subjects from both AI and MC groups could have been included either in the BE or NBE groups.



Table 1

Summary of group names by abbreviation, description, and source (see text for complete details).

Abbreviation	Description	Source
AI	Appendectomy patients who were interviewed	All appendectomy patients in hospital during the study period (except those included in the ANI group)
ANI	Appendectomy patients who were not interviewed	Appendectomy patients that could not be interviewed
MC	Matched cases	Selected from among surgery patients (other than appendectomy) in hospital during the study period
BE	Following the interview a birth event was found in the personal history	Drawn from both AI and MC groups
NBE	Following the interview a birth event was not found in the personal history	Drawn from both AI and MC groups





## RESULTS

Preliminary considerations. Because almost 30% of the potential subjects have not been included in the study, there existed the possibility of some kind of bias. Therefore, the sex distribution, the mean age, and the proportions of normal appendices of the AI and ANI groups were compared. The sex and age data were obtained from the Operating Room records, the condition of the removed appendix from the pathologist's report. Other data on the ANI group were not available.

Table 2

Distribution of males and females  
in the AI and ANI groups.

Group	Male	Female	Total
AI	21	14	35
ANI	6	8	14
Total	27	22	49

The sex distribution of both groups is presented in Table 2. The test of significance of the difference between proportions yielded a result of  $z < 1$ . The mean age of the AI group was 28.34 years, and the mean age of the ANI group was 30.00 years; a t-test of the difference between means yielded a result of  $t < 1$ . The proportion of normal



appendices in the AI group was 0.11, in the ANI group this proportion was 0.29; a test of significance of the difference between proportions yielded a value of  $z = 1.04$  ( $p > .05$ ). On the basis of these findings it was concluded that on those characteristics compared the ANI group did not differ significantly from the AI group.

When matched cases for patients in the AI group were selected, a leeway of two years in either direction was allowed. The mean ages of the AI group (28.34 years) and of the MC group (28.66 years) were compared, yielding a value of  $t < 1$ . As mentioned above, the sex distribution in both groups was identical.

Test of the hypotheses. As can be seen from Table 3, a very small number of subjects could be assigned to the BE group according to the original definition of birth event (p.14). The test of significance of the difference between proportions yielded a result of  $z < 1$ .

Table 3

Distribution of appendectomies and other operations in the BE and NBE groups (the groups defined according to the original specifications).

Group	Type of operation		
	Appendectomy	Other	Total
BE	5	3	8
NBE	30	32	62
Total	35	35	70





Because psychologically important persons and the time of the birth event were defined arbitrarily, a decision was made to redefine these variables. Analysis of the interview questionnaires revealed that in the majority of the cases the most important people for the subject were members of the family, sociometric choices beyond the family circle being given usually only when explicitly requested. Therefore, only family members (as originally defined) were left in the category of "persons involved in the birth event". On the other hand, when asked about recent or forthcoming births, the subjects mentioned events in the remote past and months ahead. However, subjects did not mention expected births beyond six months ahead. It seemed reasonable, therefore, to impose a six months time limit upon births in the past, and the same time limit was imposed upon weddings. The new definition of a birth event, involving changes in time and persons, arrived at on the basis of the data, is as follows: (a) time--within six months before or after the operation, (b) persons involved--parents of the subject, spouse, siblings, children, aunts, uncles, first cousins, (c) birth event--retained as defined originally, i.e., birth of a baby, expected birth, and a wedding at which the subject was present.

The subjects were assigned to the BE and NBE groups according to the new definition and the data were reanalyzed. The results henceforth presented are based on the new definition of the groups and all tests of significance are two-tailed.



Table 4  
Distribution of appendectomies and other  
operations in the BE and NBE groups.

Group	Type of operation		
	Appendectomy	Other	Total
BE	17	5	22
NBE	18	30	48
Total	35	35	70

The data presented in Table 4 support the first hypothesis. The test of significance of the difference between proportions yielded a result of  $z = 2.83$  ( $p < .005$ ). There was a significant association between appendectomy and a birth event. An association between other operations and birth event did not exist.

Table 5  
Distribution of pathological and  
normal appendices in the BE and  
NBE groups.

Group	Condition of appendix		
	Pathological	Normal	Total
BE	15	2	17
NBE	16	2	18
Total	31	4	35

Table 5 shows that the proportions of normal appendices were virtually the same in both groups. Therefore, the second hypothesis of this study has to be rejected.





Table 6

Distribution of appendectomies and other operations in the BE and NBE groups among young females and in the rest of the sample.

Group	Young females			Rest of the sample			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BE	4	2	6	13	3	16	22
NBE	3	6	9	15	24	39	48
Total	7	8	15	28	27	55	70

For the purpose of testing the third hypothesis, "young females" were defined as females aged 15-29 on the day of the operation. Table 6 shows that among young females the proportion of appendectomies in the BE group was 0.67, while in the rest of the sample it was 0.81. The results are in the opposite direction to that predicted. The third hypothesis has to be rejected.

Table 7

Distribution of appendectomies and other operations in the BE and NBE groups among females with upper SES and in the rest of the sample.

Group	Upper SES females			Rest of the sample			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BE	3	2	5	14	3	17	22
NBE	6	8	14	12	22	34	48
Total	9	10	19	26	25	51	70



The group of females with high socioeconomic status (high SES) was very small (Appendix A describes the method of construction of SES indices); therefore, it was combined with the group of females with medium SES. The combined group is termed as having "upper SES". In Table 7 it is found that among upper SES females the proportion of appendectomies in the BE group was 0.60, while in the rest of the sample it was 0.82. The results were in the opposite direction to the predicted one. The conclusion is that the fourth hypothesis has to be rejected.

Additional findings. Information on subjects' sex, age, place of birth, SES, marital status, and being or not being a parent was available. The sample was broken down according to the values of these variables and statistical analysis of the data carried out.

Table 8

Distribution of appendectomies and other operations in the BE and NBE groups among males and females.

Group	Males			Females			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BE	9	3	12	8	2	10	22
NBE	12	18	30	6	12	18	48
Total	21	21	42	14	14	28	70





Table 8 shows that the sex variable was not an important factor. Among the males the difference between the proportions of appendectomies in the BE and NBE groups was 0.350; among the females the difference was 0.467. The difference between the differences was 0.117 and this value was not significant ( $z < 1$ ).

Table 9

Distribution of appendectomies and other operations in the BE and NBE groups among younger and older subjects.

Group	15-29 years			30+ years			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BE	12	4	16	5	1	6	22
NBE	8	17	25	10	13	23	48
Total	20	21	41	15	14	29	70

The breakdown of the sample according to age, type of operation, and assignment to the experimental groups is presented in Table 9. Among the younger subjects the difference between the proportions of appendectomies in the BE and NBE groups was 0.350; in the older group this difference was 0.398. Comparison of the differences yielded a result of  $z < 1$ .



Table 10

Distribution of appendectomies and other operations in the BE and NBE groups among subjects born in Canada and subjects born abroad.

Group	Born in Canada			Born abroad			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BE	15	3	18	2	2	4	22
NBE	13	25	38	5	5	10	48
Total	28	28	56	7	7	14	70

Table 10 indicates that place of birth was an important variable. While among people born in Canada there was a significant difference between the proportions of appendectomies in the BE and NBE groups ( $z = 3.15$ ,  $p < .002$ ), such difference did not appear among people born abroad ( $z = 0$ ). It is, perhaps, of interest to note that among subjects born abroad the distribution of appendectomies and other operations in the experimental groups was exactly according to chance expectations.





Table 11

Distribution of appendectomies and other operations in the BE and NBE groups among subjects with low SES and upper SES.

Group	Low SES			Upper SES			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BE	9	0	9	8	5	13	22
NBE	5	12	17	13	18	31	48
Total	14	12	26	21	23	44	70

The group of subjects with high SES was very small (nine cases only). For this reason, it was combined with the group of subjects with medium SES; the combined group is termed as having "upper SES". The data presented in Table 11 show that in the low SES group the difference between the proportions of appendectomies in the BE and NBE groups was 0.706; in the upper SES group the difference was 0.196. Comparison of the differences yielded a value of  $z = 1.93$  ( $p < .06$ ). This result did not meet the usual rule of thumb requirement that the level of probability should be 5%. Nonetheless, considering the smallness of the sample, the result seems to indicate that the association between birth events and appendectomies was much stronger in the lower than in the upper social classes. This finding will be discussed later as if it had met the usual requirement for level of significance.



Table 12

Distribution of appendectomies and other operations in the BE and NBE groups among married and unmarried subjects.

Group	Married			Unmarried			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BE	11	2	13	6	3	9	22
NBE	6	17	23	12	13	25	48
Total	17	19	36	18	16	34	70

The sample did not include widowed persons. Four subjects who were either divorced or separated were included with the single subjects in the "unmarried" group. Among the married subjects the difference between the proportions of appendectomies in the BE and NBE groups was 0.585; among the unmarried subjects the difference was 0.187. Comparison of the differences yielded a value of  $z = 1.53$  ( $p < .13$ ). The result was not significant at 5% level. On the other hand, computation of Tschuprow's T yielded the following results: for the married group  $T = 0.25$ ; for the unmarried group  $T = 0.01$ . This seems to denote that the association between birth events and appendectomies was stronger among the married than among the unmarried subjects.





Table 13

Distribution of appendectomies and other operations in the BE and NBE groups among parents and non-parents.

Group	Parents			Non-parents			Grand total
	Type of operation			Type of operation			
	App.	Other	Total	App.	Other	Total	
BF	11	2	13	6	3	9	22
NBE	8	13	21	10	17	27	48
Total	19	15	34	16	20	36	70

As shown in Table 13, among the parents the difference between the proportions of appendectomies in the BE and NBE groups was 0.465; among the non-parents the difference was 0.297. The difference between the differences was 0.168 and this result was not significant ( $z < 1$ ).



## DISCUSSION

When the birth event concept was redefined, the necessary decision to exclude friends from the group termed "persons involved" could be viewed as somewhat arbitrary (p.18). The data subsequently presented give additional support to this change (Table 10). It is usual that a person born in Canada has a great majority of, or even the whole of his family in this country, and a person born abroad has probably left behind a great part of his family in the country of origin. If the birth events in the family were not the only important ones, the differences between the proportions of appendectomies in the BE and NBE groups should be about the same for subjects born in Canada and subjects born abroad. Among subjects born in Canada there is a significant difference between proportions of appendectomies in the BE and NBE groups, while this difference does not exist among subjects born abroad (Table 10). This fact further justifies the above-mentioned decision. A stimulus transmitted across the ocean in the form of a letter is probably not as effective as seeing a pregnant woman or a new addition to the family. People who have their families in this country have more occasions to receive these stimuli and the stimulus impact is greater.

It could be argued that the observed differences between proportions differences are due to cultural dissimilarities between people born in Canada and abroad. In reply it may be pointed out that the immigrants included in the sample





were born in Western and Central Europe and in U.S.A., that is, in cultures that contributed heavily to the formation of the present Canadian culture and still are quite similar to it. Furthermore, the hypotheses of this study are based on European observations of association between birth events and appendicitis. The fact that this phenomenon was noticed in Europe seems to indicate that the different results obtained for Canada-born and immigrant groups are not due to cultural dissimilarities.

The main hypothesis. The data presented lend strong support to the first hypothesis of this study. When surgery patients are divided into two groups, the appendectomies and other operations, appendectomies follow birth events more frequently than the other operations combined.

An important view of psychosomatic disease and emotion in general is the Papez-MacLean theory. This theory, as developed by MacLean (1949), considers the limbic system (sometimes termed rhinencephalon) as the centre of emotion. Furthermore, it is pointed out that there are many strong connections between the limbic system and the centres of the autonomic nervous system as contrasted with difficulty in demonstrating pathways between the neocortex and the hypothalamus. This suggests the dominance of the limbic system in the realm of visceral activity. Consequently, MacLean refers to the limbic system as the "visceral brain", to distinguish it from the neocortex ("word brain") which controls the body musculature and



suberves the function of the intellect.

The topographical position of the limbic system in the brain seems to enable it to associate many unrelated phenomena. "This region of the brain appears to be so strategically situated as to be able to correlate every form of internal and external perception. In other words, the possibility exists in this region for bringing into association not only oral and visceral sensations, but also impressions from the sex organs, body wall, eye, and ear" (MacLean, 1949, p. 351). MacLean goes on to emphasize that "...in contrast to the neopallium, the rhinencephalon has many and strong connections with the hypothalamus for discharging its impressions". To put it somewhat differently, the phylogenetically older part of the brain (the limbic system) is capable of associating different stimuli, but is incapable of analyzing them. "Considered in the light of Freudian psychology, the visceral brain would have many of the attributes of the unconscious..." (p.348).

The strong support lent to this theory by subsequent experimental work enabled Morgan (1965) to state: "The Papez-MacLean theory is now much more than a theory. It is a general description of what experiment has established, namely, that the limbic system is the central system in emotion" (p. 312).

It is now possible to see the implications of this theory for the explanation of the dynamics of psychosomatic disorders. MacLean (1949) says "...it should be remarked





that one of the striking observations regarding the patient with psychosomatic illness is his apparent intellectual inability to verbalize his emotional feelings.... In the psychosomatic patient it would almost seem there was little direct exchange between the visceral brain and the word brain, and that emotional feelings built up in the hippocampal formation, instead of being relayed to the intellect for evaluation, found immediate expression through autonomic centers. In other words, emotional feelings, instead of finding expression and discharge in the symbolic use of words and appropriate behavior, might be conceived as being translated into a kind of 'organ language'" (p. 350).

The original problem remains to be explained. Birth is preceded by a sexual intercourse. In Western culture birth per se is not considered a taboo subject. By contrast, sexual intercourse is a taboo subject. It is understandable that once a person has learned "where babies come from", the two subjects of birth and sexual intercourse become inseparable. Consciously a person may be preoccupied with thoughts about birth, pregnancy, or a new baby, but unconsciously he is preoccupied with sexual fantasies. Following this association, conscious and unconscious birth fantasies occur. The first kind is perfectly acceptable to society and the inner moral censor (the superego), the second kind is abhorrent to both society and the inner moral censor. It can be assumed with confidence that whenever the second type of fantasy emerges (and it likely follows the conscious preoccupation



with birth), feelings of guilt arise as well. The feelings of guilt remain unconscious and, of course, their source remains unconscious. These feelings are "stored" in the limbic system and never reach the neocortex. The psychic tension is not discharged through verbal or other behavior, controlled by the neocortex, but downward through the limbic system, using "organ language". The vermiform appendix, being a part of the viscera and controlled by the autonomic nervous system, is well fitted to express "organ language".

There is one type of sexual intercourse which is fully sanctioned in Western culture; that between husband and wife. Sexual fantasies concerning one's spouse do not usually cause feelings of guilt. If the foregoing explanation is valid, wives should not have appeared among persons with birth event preceding appendectomy. There were six married males undergoing appendectomy in the BE group<sup>5</sup>; two of them mentioned their wives as persons associated with birth events. In both cases the pregnancy preceded the marriage: one married when his bride was in the sixth month of pregnancy; the second, while only 17 years old, was already a father of a 2 1/2 months old baby. In this case also the marriage was probably contracted to sanction the pregnancy (the date of marriage was not obtained).<sup>6</sup> In

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5 Because of the small number, statistical analysis was not attempted.

6 Considering the age of his baby, it is of interest to note that this patient succumbed to appendicitis almost exactly a year after having the intercourse with his future wife which led to her out-of-wedlock pregnancy.





both instances, then, strong feelings of guilt might have arisen.

An attempt may be made now to explain the puzzling phenomenon of very low frequency of appendicitis during the first two years of life (Longino, Holder, & Gross, 1958). Two complementary hypotheses may be advanced: (a) the young child's vocabulary is very limited, he cannot understand notifications about birth events; (b) the mechanism of repression is not yet established at this early age; when psychic tension accumulates in the nervous system it can be relayed to the neocortex and discharged behaviourally rather than somatized.

The reason the vermiform appendix is selected as the site of the lesion remains an open question.

It could be maintained that appendicitis is akin to pseudocyesis. However, the data presented by Bivin and Klinger (1937) seem to refute this assumption. These authors review 444 cases of pseudocyesis described in the literature during the period 1685-1935, and appendicitis is never associated with pseudocyesis.<sup>7</sup> It is hardly likely, in any case, that a diagnostician would confuse pseudocyesis and appendicitis.

Another possible explanation of this finding is that the birth event gives rise to a birth wish, which is expressed through appendectomy (symbolic delivery). If this is so,

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7 Although some of the cases reviewed are from the period in which medicine did not recognize appendicitis as a clinical entity, the majority of the cases were presented after 1889, i.e., after the differential diagnosis of appendicitis had been firmly established (Short, 1946).



then among childless people there should be a stronger association between birth events and appendectomies than among parents. This supposition, however, is not supported by the data presented in Table 13.

At this present writing, little more than speculation may be advanced toward more acceptable explanations: (a) it is possible that not only the appendix is affected following birth event (Inman, 1958, 1962, 1965), (b) there might be a familial predisposition (constitutional or other) toward the same type of illness<sup>8</sup> (Adler, 1929), (c) the appendix is situated in the pelvic region. These hypotheses need not be considered mutually exclusive.

The remaining hypotheses. The second hypothesis of this study stated that the proportion of normal appendices will be higher in appendectomies following birth events than in appendectomies not following birth events. This hypothesis was rejected. It was based on the findings of the Ingram research (1965), where it was reported that patients who had normal appendices removed exhibited more emotional problems than patients who had pathological appendices removed. The implicit assumption behind this hypothesis was that birth events (and birth fantasies) being psychogenic factors represent emotional problems and are associated with functional illness. However, the Ingram sample did not exclude all those patients who had a postoperative

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8 60% of the appendectomy patients included in the sample reported that at least one of their parents or siblings also underwent appendectomy.





diagnosis other than "appendicitis". In other words, all the diagnostic errors of the surgeons were included in the sample.<sup>9</sup> On the other hand, in the present study the possibility of diagnostic error was greatly reduced by excluding from the sample all those patients who did not have a postoperative diagnosis of "appendicitis". The present sample represents a different population and, as might be expected, the results are different.

The third and the fourth hypotheses had the same implicit assumption behind them and were an attempt to replicate the findings of Meyer, Unger, and Slaughter (1964). Again, the population studied was different in the present investigation. The Meyer, like that of the Ingram work, included all appendectomy patients in the sample and this explains the rejection of these hypotheses. An additional reason for rejection of the fourth hypothesis may be the great difference between definitions of SES used by the Meyer and present study.

An important conclusion may be reached following the acceptance of the first and rejection of the second, third and fourth hypotheses; namely, psychogenic factors appear to operate in the genesis of appendicitis with an organic basis.

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9 This fact explains, perhaps, why Ingram found more health complaints after the removal of normal as contrasted with that of pathological appendix. The Meyer group (1964) also reported more illness under similar circumstances. It is evident that, following a wrong diagnosis, a healthy organ was removed, leaving the real cause of complaints unattended.



Additional findings. The SES factor appeared to be a notably important determinant of the strength of association between birth events and appendectomies (Table 11). There are many psychosocial differences between social classes and it is difficult to exhaust all the possibilities. Some of these differences may possibly contribute to the observed difference in the strength of the association between birth events and appendectomies in different social classes.

It has been found that members of the lower social class very frequently have relatives, outside their immediate households, living in the same community (Pineo, 1964). By way of contrast, members of the middle and upper classes are often isolated geographically from their kinship groups (Seeley, Sim & Loosley, 1964). In these classes young people leave the communities in which they have grown, bringing with them to the new place only their nuclear families. The geographical isolation is also a social isolation (Seeley et al., 1964). The ties with the kinship group are weak, the psychological importance of the non-nuclear part of the family becomes marginal.

Differential patterns of social activities are another factor which may be considered in this context. Members of the middle and upper classes generally join formal associations and frequently more than one (Komarovsky, 1946). On the other hand, members of the lower social class rarely join formal associations, and if they do, often remain





inactive. In this class the leisure time is spent in informal groups composed predominantly of relatives (Dotson, 1951). The social activities are restricted to the kinship group and centred upon it. Family celebrations and other familial events figure prominently against this background, they probably attain more importance in the lower than in any other social class.

These two patterns of life may be contrasted: in the lower class the family unit is embedded in an extended kinship system and family's social activities are restricted to it. In the upper classes the family unit is isolated geographically and socially from its kinship group. Birth events in the non-nuclear part of the family probably lose much of their psychological impact in the upper social classes as compared to the lower class.

Finally, there exists a possibility that because of the differences in modes of communication (Schatzman & Strauss, 1955) members of the lower social class tend to verbalize less their emotions. Following socially unacceptable fantasies, the discharge (direct or indirect) of feelings of guilt through verbal behaviour is not as readily available to them as to the members of middle and upper classes.

It was also found that there was a stronger association between birth events and appendectomies in the group of married than in the group of unmarried subjects (Table 12). This finding should be related to the fact



that the marriage ceremony frees the couple to anticipate parenthood; unmarried persons according to existing social mores, should not plan to have children. Therefore, married people probably pay more attention to birth events and these are apt to attain more prominence in their psychological world.

Suggestions for further research. The most challenging question to be submitted to future research is whether the morbid influence of a birth event is restricted to appendicitis-appendectomy sequence, or whether there are some other diseases as much related to birth event.

Another interesting problem is the length of time elapsing between a birth event and the onset of illness. A closely related problem is whether an attack of appendicitis is temporally associated with the actual date of birth (or wedding), or with the date on which the future patient learned about the birth (or his participation in the wedding).

In this study birth fantasies were related to a birth event actually taking place in real life. However, as seen in the case of Dora (Freud, 1905), birth fantasies can be related to an imagined birth event as well. Furthermore, birth fantasies might possibly arise without being preceded by a birth event (real or imagined). Future research will probably attempt to discover the circumstances upon which birth fantasies may appear.

Finally, a cross-cultural research should be conduct-





ed to ascertain whether the association between birth events and the appendicitis-appendectomy sequence can be found in non-Western cultures, or if it is a culturally restricted phenomenon.



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## APPENDIX A

## The method of construction of SES indices.

Three factors were considered as determining the SES of a subject: education, income, and occupation. All the factors had equal weight. On each factor a person could receive 1-3 points, the values of the three factors were summed up and the result considered as indicating the SES level of this person. Table A-1 describes the assignment of points on each factor.

Table A-1

Assignment of points for education, income and occupation.

Points Factor	1	2	3
Education	0-9 years	10-12 years	13 + years
Income	Less than \$5,000 per year	\$5,000 - \$10,000 per year	More than \$10,000 per year
Occupation	Labourers - any level of skill (including farm hands)	Clerical, sales, tech- nicians, farmers, small businessmen	Professional, managerial, large business- men and proprietors

The total number of points for an individual could vary between 3-9 points. Subjects receiving 3-4 points were considered as having low SES, 5-7 points--medium SES, 8-9 points--high SES.



If a subject was still attending a high school, the occupation and the education of his father were considered; if he was attending an educational institution of a level higher than a high school, the occupation of his father, but his own education were considered. If a subject was a housewife, the occupation of her husband was considered.

The information about the education, income, and occupation was obtained from each subject during the interview (see questions 54, 57-61 in Appendices B and C). Whenever doubt has arisen as to the classification of a particular occupation, Hollingshead's (1957) index was consulted.

Example: Suppose that a subject was a truck driver, has completed 11 years of schooling, and the gross income of his family was \$6,000 per year. He received one point on the occupational scale, two points on the educational scale, and two points on the income scale. His total number of points was five, accordingly his SES was defined as "medium".





## The Questionnaire

For the interviewer: After introducing yourself, say: "We are conducting a study among the patients in the hospital. I shall be very grateful to you if you would like to spend some time with me, helping in this study." If the patient agrees, read the following statement to him before asking the first question:

"The purpose of this research is to provide us with knowledge about some illnesses. The information that you give me will be considered strictly confidential. I shall take every precaution not to reveal your identity to anyone. I am sure you will realize that this interview is not a part of your regular hospital treatment; it is a part of a research project that may be helpful in the future. Your doctor has been notified about this project and he thought you would be glad to help. We shall talk about your present illness and also some more general topics--about your life."

## The Questions

1. You have just had an operation. Have you had any previous operations?

(If no, omit questions 2 and 3)

2. What were they/was it for?

3. When were you operated on ? (If the patient does not remember, ask: Approximately how many years ago was this operation performed?)

4. Except for the pain you had before the appendectomy, have you had any abdominal pains in the past? (If the answer is negative, probe by repeating the key word)

(If after the probe the answer remains negative, omit questions 5 - 11)

5. About how many times a year have these pains occurred?



6. In which parts of the abdomen have you had these pains?...If you know, name the organs affected.

7. How long ago was it when you last had these pains?

(If the patient is a male, omit questions 8 - 11)

8. Were these pains like the pain connected with childbirth?

9. Were these pains like the pain that comes with a menstrual period?

10. When did your last menstrual period start? (Obtain exact date)

11. How long is it from the first day of one period to the first day of the next?

12. I am going to ask you about your family. By that I mean your husband/wife, parents, brothers, sisters, your children, aunts, uncles, and first cousins. Has anybody in your family ever had an appendectomy? (If necessary, explain once more to the patient that by "family" you mean spouse, parents, siblings, patient's children, aunts, uncles, first cousins)

(If no, omit question 13)

13. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below. In this question and in question 15, 17, etc., when the name of the ill family member does not indicate his sex, ask: "Is\_\_\_\_\_a man or a woman?" or: "Is\_\_\_\_\_a boy or a girl?"--as the case might be. Put M or F after the name in the table.)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			





14. Has anyone in your family ever suffered from peptic ulcer? (Explain to the patient that by "family" you mean the same relatives as in question 12)

(If no, omit question 15)

15. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

16. Has anybody in your family ever suffered from arthritis? (Family is defined as in question 12)

(If no, omit question 17)

17. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

18. Has anyone in your family ever suffered from any heart disorder? (Family is defined as in question 12)

(If no, omit question 19)

19. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

20. Has anybody in your family had a baby recently? (Family is defined as in question 12. If the patient asks what you mean by "recently," answer: "Within



the last month before you were admitted to the hospital. However, accept all birth events cited by the patient, regardless of their dates.)

(If no, omit question 21)

21. Who? How is he/she related to you? How old is he/she? When? (Obtain exact date. If a spouse of a blood relative was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

First Name	Relationship	Age	Time
1. _____			
Spouse _____			
2. _____			
Spouse _____			
3. _____			
Spouse _____			

22. Does anybody in your close family expect a baby soon? (Close family is defined as in question 12. If the patient asks what you mean by "soon" answer: "Within the next month." However, accept all forthcoming births cited by the patient, regardless of their dates.)

(If no, omit question 23)

23. Who? How is he/she related to you? How old is he/she? When? (If a spouse of a blood relative was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

First Name	Relationship	Age	Time
1. _____			
Spouse _____			
2. _____			
Spouse _____			
3. _____			
Spouse _____			

24. By the way....Has anybody in your family adopted a baby recently, or perhaps expects to adopt a baby soon? (Family is defined as in question 12. If the patient asks what you mean by "recently" or "soon," answer: "Within the last/next month." However, accept all cases of adoption mentioned by the patient





regardless of their dates.)

(If no, omit question 25)

25. Who? How is he/she related to you? How old is he/she? When? (If a spouse of a blood relative is mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

	First Name	Relationship	Age	Time
1.	_____			
	Spouse _____			
2.	_____			
	Spouse _____			
3.	_____			
	Spouse _____			

26. Has anybody among your friends, neighbors and more distant relatives ever had an appendectomy?

(If no, omit question 27)

27. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

28. Has anyone among your friends, neighbors and more distant relatives ever suffered from peptic ulcers?

(If no, omit question 29)

29. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			



First Name

Relationship

Age

Time

2. \_\_\_\_\_

3. \_\_\_\_\_

30. Has anyone among your friends, neighbors and more distant relatives ever suffered from arthritis?

(If no, omit question 31)

31. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

First Name

Relationship

Age

Time

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

32. Has anyone among your friends, neighbors and more distant relatives ever suffered from any heart disorder?

(If no, omit question 33)

33. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

First Name

Relationship

Age

Time

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

34. Has anybody among your friends, neighbors and more distant relatives had a baby recently? (If the patient asks what you mean by "recently," answer: "Within the last month before you were admitted to the hospital." However, accept all the births cited by the patient regardless of their dates.)

(If no, omit question 35)

35. Who? How is he/she related to you? How old is he/she? When? (Obtain exact date. If the spouse of anybody in this group was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)





First Name	Relationship	Age	Time
1. _____			
Spouse _____			
2. _____			
Spouse _____			
3. _____			
Spouse _____			

36. Does anyone among your friends, neighbors and more distant relatives expect a baby soon? (If the patient asks what you mean by "soon," answer: "Within the next month." However, accept all forthcoming births cited by the patient, regardless of their dates.)

(If no, omit question 37)

37. Who? How is he/she related to you? How old is he/she? When? (If the spouse of anybody in this group was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

First Name	Relationship	Age	Time
1. _____			
Spouse _____			
2. _____			
Spouse _____			
3. _____			
Spouse _____			

38. Incidentally....Has anybody among your friends, neighbors, and more distant relatives adopted a baby recently, or perhaps expects to adopt a baby soon? (If the patient asks what you mean by "recently" or "soon," answer: "Within the last/next month." However, accept all cases of adoption mentioned by the patient, regardless of their dates.)

(If no, omit question 39)

39. Who? How is he/she related to you? How old is he/she? When? (If the spouse of anybody in this group was mentioned first, obtain the above information about both



members of the pair. Fill out the table below.)

	First Name	Relationship	Age	Time
1.	_____			
	Spouse _____			
2.	_____			
	Spouse _____			
3.	_____			
	Spouse _____			

40. Have you recently had any visitors in your home? (If the patient asks what you mean by "recently," answer: "During the last month before you were admitted to the hospital.")

41. (To the interviewer: If question 40 was answered affirmatively, elicit information concerning the time of the visit, number of guests, relationship of the visitors to the patient, and reasons for the visit.)





42. Had you visited anyone in the city or out of town a short time before you were admitted to the hospital? (If the patient asks what you mean by "short time," answer: "During the last month before you were admitted to the hospital.")
43. (To the interviewer: If question 42 was answered affirmatively, elicit information concerning time of the visit, relationship to the visited person, his/her domicile (do not ask about exact address), reason for the visit, and whether the patient paid this visit alone or was accompanied by somebody.)
44. Had you intended to visit anyone in the city or out of town, but the admission to the hospital prevented you from doing so?



45. (To the interviewer: If question 44 was answered affirmatively, proceed as in question 43.)
46. Had you attended a celebration, party, or reception--like a wedding, birthday, or anniversary--a short time before you were admitted to the hospital; or had you perhaps expected to attend one, but admission to the hospital prevented you from doing so? (If the patient asks what you mean by "short time," answer: "During the last month before you were admitted to the hospital.")
47. (To the interviewer: If question 46 was answered affirmatively, elicit information concerning the time and type of the celebration, relationship of the patient to the celebrating person, and whether the patient went (or intended to go) alone or was accompanied by somebody.)





48. Some people we like more, some people we like less....Those whom we like most we usually think of as being closest to us. I would like you to think now about all the people that you know....And now tell me who are the five people you like most, that you feel are closest to you. Start with the one most liked, then the second most liked and so on. (Put names in appropriate spaces)

First Name	Sex	Relationship	Age
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

49. Is \_\_\_\_\_ a man or a woman (or, a boy or a girl)? (Ask this question only if the name does not indicate the sex) How is he/she related to you? How old is he/she? (Fill out appropriate spaces in question 48)

(If none of the persons mentioned above is a member of the "family" as defined in question 12, omit questions 50 and 51.)

50. (If any of the five persons mentioned above is a member of the "family," ask: \_\_\_\_\_ is your \_\_\_\_\_ (use the name of the person and the relationship to the patient) and \_\_\_\_\_ is your \_\_\_\_\_, etc. (mention all "family" members listed in the answer to question 48) If you were to exclude your husband/wife, parents, brothers, sisters, your children, aunts, uncles and first cousins (the order of mentioning the relatives should be changed according to the patient's choices given above), who are the five people you like most, that you feel are closest to you? (Put names in appropriate spaces)

First Name	Sex	Relationship	Age
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

51. Is \_\_\_\_\_ a man or a woman (or, a boy or a girl)? (Ask this question only if the name does not indicate the sex) How is he/she related to you? How old is he/she? (Fill out appropriate spaces in question 50)

52. What country were you born in?

53. What is your date of birth?



54. What is your occupation? (If housewife, ask about husband's occupation)

55. Do you have any children? (If yes, ask about age and sex of each child)

56. Do you have any brothers or sisters? (If yes, ask about age and sex of each sibling)

57. What was the last school grade you completed?      0 - 9 \_\_\_\_\_  
 10 - 11 \_\_\_\_\_      12 \_\_\_\_\_      13+ \_\_\_\_\_

(Ask questions 58 and 59 only if the interviewee is 18 years old or younger)

58. What is/was your father's occupation?

59. Could you tell me how much schooling your father had?      0 - 9 \_\_\_\_\_  
 10 - 11 \_\_\_\_\_      12 \_\_\_\_\_      13+ \_\_\_\_\_

60. Are you living with your parents or one of them?

61. For the purpose of our survey we need to have a rough indication of the income of your family. This has nothing to do with your hospital bill or your doctor's bill. Would you tell me in which of these classes it falls? (Check one)

\$5,000 or less per year \_\_\_\_\_  
 More than \$5,000 but less than \$10,000 per year \_\_\_\_\_  
 \$10,000 or more per year \_\_\_\_\_

62. (Sex of the patient)

63. (Marital status of the patient)





64. (Date of the operation)

65. (Date of the interview)

66. (Name and hospital number)

67. (Pathologist's diagnosis)

For the interviewer: Say now, "Thank you very much for your co-operation. You have been very helpful. I hope that this information will one day help others. That finishes the questions I had to ask.....Do you have any questions?"



## APPENDIX C

## The Questionnaire

For the interviewer: After introducing yourself, say: "We are conducting a study among the patients in the hospital. I shall be very grateful to you if you would like to spend some time with me, helping in this study." If the patient agrees, read the following statement to him before asking the first question:

"The purpose of this research is to provide us with knowledge about some illnesses. The information that you give me will be considered strictly confidential. I shall take every precaution not to reveal your identity to anyone. I am sure you will realize that this interview is not a part of your regular hospital treatment; it is a part of a research project that may be helpful in the future. Your doctor has been notified about this project and he thought you would be glad to help. We shall talk about your present illness and also some more general topics--about your life."

## The Questions

1. You have just had an operation. Have you had any previous operations?

(If no, omit questions 2 and 3)

2. What were they/was it for?

3. When were you operated on? (If the patient does not remember, ask: Approximately how many years ago was this operation performed?)

4. Except for the pain you had before the \_\_\_\_\_ (use the name of the patient's illness), have you had any abdominal pains in the past? (If the answer is negative, probe by repeating the key word)

(If after the probe the answer remains negative, omit questions 5 - 11)

5. About how many times a year have these pains occurred?





6. In which parts of the abdomen have you had these pains?...If you know, name the organs affected.

7. How long ago was it when you last had these pains?

(If the patient is a male, omit questions 8 - 11)

8. Were these pains like the pain connected with childbirth?

9. Were these pains like the pain that comes with a menstrual period?

10. When did your last menstrual period start? (Obtain exact date)

11. How long is it from the first day of one period to the first day of the next?

12. I am going to ask you about your family. By that I mean your husband/wife, parents, brothers, sisters, your children, aunts, uncles, and first cousins. Has anybody in your family ever had a \_\_\_\_\_? (Use the name of the illness and, if necessary, explain once more to the patient that by "family" you mean spouse, parents, siblings, patient's children, aunts, uncles, first cousins)

(If no, omit question 13)

13. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below. In this question and in question 15, 17, etc., when the name of the ill family member does not indicate his sex, ask: "Is \_\_\_\_\_ a man or a woman?" or: "Is \_\_\_\_\_ a boy or a girl?"--as the case might be. Put M or F after the name in the table.)

First Name	Relationship	Age	Time
1. _____			
2. _____			
3. _____			



14. Has anyone in your family ever had an appendectomy? (Explain to the patient that by "family" you mean the same relatives as in question 12)

(If no, omit question 15)

15. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

16. Has anybody in your family ever suffered from peptic ulcer? (Family is defined as in question 12)

(If no, omit question 17)

17. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

18. Has anyone in your family ever suffered from any heart disorder? (Family is defined as in question 12)

(If no, omit question 19)

19. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

20. Has anybody in your family had a baby recently? (Family is defined as in question 12. If the patient asks what you mean by "recently," answer: "Within





the last month before you were admitted to the hospital. However, accept all birth events cited by the patient, regardless of their dates.)

(If no, omit question 21)

21. Who? How is he/she related to you? How old is he/she? When? (Obtain exact date. If a spouse of a blood relative was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

	First Name	Relationship	Age	Time
1.	_____			
	Spouse	_____		
2.	_____			
	Spouse	_____		
3.	_____			
	Spouse	_____		

22. Does anybody in your close family expect a baby soon? (Close family is defined as in question 12. If the patient asks what you mean by "soon" answer: "Within the next month." However, accept all forthcoming births cited by the patient, regardless of their dates.)

(If no, omit question 23)

23. Who? How is he/she related to you? How old is he/she? When? (If a spouse of a blood relative was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

	First Name	Relationship	Age	Time
1.	_____			
	Spouse	_____		
2.	_____			
	Spouse	_____		
3.	_____			
	Spouse	_____		

24. By the way....Has anybody in your family adopted a baby recently, or perhaps expects to adopt a baby soon? (Family is defined as in question 12. If the patient asks what you mean by "recently" or "soon," answer: "Within the last/next month." However, accept all cases of adoption mentioned by the patient



regardless of their dates.)

(If no, omit question 25)

25. Who? How is he/she related to you? How old is he/she? When? (If a spouse of a blood relative is mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

	First Name	Relationship	Age	Time
1.	_____			
	Spouse _____			
2.	_____			
	Spouse _____			
3.	_____			
	Spouse _____			

26. Has anyone among your friends, neighbors and more distant relatives ever had a \_\_\_\_\_? (Use the name of the patient's illness)

(If no, omit question 27)

27. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	_____			
2.	_____			
3.	_____			

28. Has anyone among your friends, neighbors and more distant relatives ever had an appendectomy?

(If no, omit question 29)

29. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

	First Name	Relationship	Age	Time
1.	1. _____			





First Name

Relationship

Age

Time

2. \_\_\_\_\_

3. \_\_\_\_\_

30. Has anyone among your friends, neighbors and more distant relatives ever suffered from peptic ulcer?

(If no, omit question 31)

31. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

First Name

Relationship

Age

Time

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

32. Has anyone among your friends, neighbors and more distant relatives ever suffered from any heart disorder?

(If no, omit question 33)

33. Who? How is he/she related to you? How old is he/she? When? (Fill out the table below)

First Name

Relationship

Age

Time

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

34. Has anybody among your friends, neighbors and more distant relatives had a baby recently? (If the patient asks what you mean by "recently," answer: "Within the last month before you were admitted to the hospital." However, accept all the births cited by the patient regardless of their dates.)

(If no, omit question 35)

35. Who? How is he/she related to you? How old is he/she? When? (Obtain exact date. If the spouse of anybody in this group was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)



First Name

Relationship

Age

Time

1. \_\_\_\_\_

Spouse \_\_\_\_\_

2. \_\_\_\_\_

Spouse \_\_\_\_\_

3. \_\_\_\_\_

Spouse \_\_\_\_\_

36. Does anyone among your friends, neighbors and more distant relatives expect a baby soon? (If the patient asks what you mean by "soon," answer: "Within the next month." However, accept all forthcoming births cited by the patient, regardless of their dates.)

(If no, omit question 37)

37. Who? How is he/she related to you? How old is he/she? When? (If the spouse of anybody in this group was mentioned first, obtain the above information about both members of the pair. Fill out the table below.)

First Name

Relationship

Age

Time

1. \_\_\_\_\_

Spouse \_\_\_\_\_

2. \_\_\_\_\_

Spouse \_\_\_\_\_

3. \_\_\_\_\_

Spouse \_\_\_\_\_

38. Incidentally....Has anybody among your friends, neighbors, and more distant relatives adopted a baby recently, or perhaps expects to adopt a baby soon? (If the patient asks what you mean by "recently" or "soon," answer: "Within the last/next month." However, accept all cases of adoption mentioned by the patient, regardless of their dates.)

(If no, omit question 39)

39. Who? How is he/she related to you? How old is he/she? When? (If the spouse of anybody in this group was mentioned first, obtain the above information about both





members of the pair. Fill out the table below.)

	First Name	Relationship	Age	Time
1.	_____			
	Spouse	_____		
2.	_____			
	Spouse	_____		
3.	_____			
	Spouse	_____		

40. Have you recently had any visitors in your home? (If the patient asks what you mean by "recently," answer: "During the last month before you were admitted to the hospital.")
41. (To the interviewer: If question 40 was answered affirmatively, elicit information concerning the time of the visit, number of guests, relationship of the visitors to the patient, and reasons for the visit.)



42. Had you visited anyone in the city or out of town a short time before you were admitted to the hospital? (If the patient asks what you mean by "short time," answer: "During the last month before you were admitted to the hospital.")
43. (To the interviewer: If question 42 was answered affirmatively, elicit information concerning time of the visit, relationship to the visited person, his/her domicile (do not ask about exact address), reason for the visit, and whether the patient paid this visit alone or was accompanied by somebody.)
44. Had you intended to visit anyone in the city or out of town, but the admission to the hospital prevented you from doing so?





45. (To the interviewer: If question 44 was answered affirmatively, proceed as in question 43.)

46. Had you attended a celebration, party, or reception--like a wedding, birthday, or anniversary--a short time before you were admitted to the hospital; or had you perhaps expected to attend one, but admission to the hospital prevented you from doing so? (If the patient asks what you mean by "short time," answer: "During the last month before you were admitted to the hospital.")

47. (To the interviewer: If question 46 was answered affirmatively, elicit information concerning the time and type of the celebration, relationship of the patient to the celebrating person, and whether the patient went (or intended to go) alone or was accompanied by somebody.)



48. Some people we like more, some people we like less....Those whom we like most we usually think of as being closest to us. I would like you to think now about all the people that you know....And now tell me who are the five people you like most, that you feel are closest to you. Start with the one most liked, then the second most liked and so on. (Put names in appropriate spaces)

First Name	Sex	Relationship	Age
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

49. Is \_\_\_\_\_ a man or a woman (or, a boy or a girl)? (Ask this question only if the name does not indicate the sex) How is he/she related to you? How old is he/she? (Fill out appropriate spaces in question 48)

(If none of the persons mentioned above is a member of the "family" as defined in question 12, omit questions 50 and 51.)

50. (If any of the five persons mentioned above is a member of the "family," ask: \_\_\_\_\_ is your \_\_\_\_\_ (use the name of the person and the relationship to the patient) and \_\_\_\_\_ is your \_\_\_\_\_, etc. (mention all "family" members listed in the answer to question 48) If you were to exclude your husband/wife, parents, brothers, sisters, your children, aunts, uncles and first cousins (the order of mentioning the relatives should be changed according to the patient's choices given above), who are the five people you like most, that you feel are closest to you? (Put names in appropriate spaces)

First Name	Sex	Relationship	Age
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

51. Is \_\_\_\_\_ a man or a woman (or, a boy or a girl)? (Ask this question only if the name does not indicate the sex) How is he/she related to you? How old is he/she? (Fill out appropriate spaces in question 50)

52. What country were you born in?

53. What is your date of birth?





54. What is your occupation? (If housewife, ask about husband's occupation)

55. Do you have any children? (If yes, ask about age and sex of each child)

56. Do you have any brothers or sisters? (If yes, ask about age and sex of each sibling)

57. What was the last school grade you completed?      0 - 9 \_\_\_\_\_  
10 - 11 \_\_\_\_\_      12 \_\_\_\_\_      13+ \_\_\_\_\_

(Ask questions 58 and 59 only if the interviewee is 18 years old or younger)

58. What is/was your father's occupation?

59. Could you tell me how much schooling your father had?      0 - 9 \_\_\_\_\_  
10 - 11 \_\_\_\_\_      12 \_\_\_\_\_      13+ \_\_\_\_\_

60. Are you living with your parents or one of them?

61. For the purpose of our survey we need to have a rough indication of the income of your family. This has nothing to do with your hospital bill or your doctor's bill. Would you tell me in which of these classes it falls? (Check one)

\$5,000 or less per year \_\_\_\_\_  
More than \$5,000 but less than \$10,000 per year \_\_\_\_\_  
\$10,000 or more per year \_\_\_\_\_

62. (Sex of the patient)

63. (Marital status of the patient)



64. (Date of the operation)

65. (Date of the interview)

66. (Name and hospital number)

67. (Pre-operative diagnosis)

68. (Operation performed)

For the interviewer: Say now, "Thank you very much for your co-operation. You have been very helpful. I hope that this information will one day help others. That finishes the questions I had to ask.....Do you have any questions?"

















